

Analysis of the effect of economic growth and population on the welfare of beef cattle farmers in West Java Province, Indonesia

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Businesses quality in the agricultural sector that are involved in the livestock industry are particularly susceptible to negative economic or social effects. Breeders and farmers, particularly those who raise beef cattle will be affected by continues and incidentally price changes or currency exchange rates because these factors have a significant impact on the beef cattle farming industry. The Gross Regional Domestic Product (GRDP) of a region changes as a result of population expansion. This study's goal was to examine how population growth and economic development affect the welfare of beef cattle breeders in West Java Province, with a particular emphasis on four (four) districts that are important hubs for small-scale livestock production: Subang Regency, Purwakarta Regency, Bogor Regency, and Sukabumi Regency. The quantitative methodology of this study analyzes numerical data modified by statistical techniques and literature review. The macroeconomic variables of population and breeder welfare are the focus of the literature review. The West Java Central Bureau of Statistics, the Office responsible for Animal Husbandry and Health Functions for Subang, Purwakarta, Bogor, and Sukabumi Regencies, as well as data from relevant journals and articles, are all sources of secondary data. Data analysis was conducted applying multiple regression analysis techniques. The study's findings concluded that the wellbeing of breeders in Indonesia's West Java Province was significantly impacted by population expansion and economic development.

Keywords: Animal farming economy, beef cattle breeders, welfare, economic growth.

INTRODUCTION

According to the West Java Province's Central Statistics Agency (BPS), there would be 125,768 breeder or farmer families raising beef cattle in West Java Province by the year 2022. Beef cattle accounted for 415,036 heads in the West Java Province in 2022, or 3.3 heads per breeder or farmer's family on average (Central Bureau of Statistics for West Java Province, 2022). The Central Bureau of Statistics in Indonesia uses the BPS criteria with a basic needs approach according to a person's lowest cost limit for eating food that is equal to 2100 calories each day and non-food items use (Central Bureau of Statistics for Subang Regency, 2021). Therefore, it is possible to define the wellbeing of farmers as the ability of breeders or farmer families to meet their consumption needs

for food and non-food items using their revenue (Central Bureau of Statistics for Subang Regency, 2021).

As predicted by the Ministry of Finance with the increased intervention of the Use of the Regional Revenue and Expenditure Budget (APBD) for the 2021 financial year (Central Bureau of Statistics for West Java Province, 2022), West Java Province's economy is expected to grow by around 3.74% in 2021 (Ministry of Finance of the Republic Indonesia, 2021) For the first time, a process of bidding will be held for operations that were planned for in the APBD at the outset of the financial year, in order to prevent an accumulation of budget expenditure towards the end of the year. In order to implement regional development, funding must come from sources other than the APBD. This will enable the creation of new jobs while also speeding up the

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convenience of investing in areas by boosting funding to areas coming from inside as well as outside the country in line with the possibilities in the areas.

The population size in a region's economic development is a crucial issue since a lack of population growth can prevent the achievement of economic development objectives, such as improving human welfare and reducing the welfare of animal breeders. According to research (Pangiuk, 2018), population growth and social welfare levels are directly correlated. This exemplifies how rapid population growth in developing countries hinders welfare levels from considerably rising and, in turn, causes welfare to drop and the number of those in need to rise (Fathurohman, 2016).

Businesses in the agricultural business sector that are involved in the livestock industry are particularly susceptible to negative economic and social effects. Breeders, particularly those of beef cattle, will be impacted by volatility in currencies and price fluctuations, in addition to changes in consumer spending power, which will have a significant impact on the beef cow farming industry. The Gross Regional Domestic Product (GRDP) of an area changes as a result of population expansion. About 50,000 hectares of land in West Java Province have been set aside for livestock, with the most common forms of allocations being land for grazing, pasture, and fodder for feed for livestock (Bogor Regency Central Statistics Agency, 2022). In light of the aforementioned background, the purpose of this study is to examine the impact of economic development and population on the breeders' welfare in the West Java Province.

LITERATURE REVIEWS

Economic development: Shavira *et al.* (2021) study In East Java Province, economic growth from 2014 to 2018 significantly and favorably impacted the welfare of the populace. Between 2014 and 2018, the minimum wage significantly and favorably affects the well-being of the inhabitants of East Java. Between 2014 and 2018, the unemployment rate had a negative impact on the wellbeing of East Java's citizens. Economic growth has a favorable effect on income inequality, albeit not considerably. Income inequality has a favorable but small effect on social well-being. Through income inequality, economic expansion indirectly affects people's welfare. This demonstrates that whereas other factors influence 65 percent of people's welfare, economic development and revenue disparity merely account for 35 percent of it. In order to create development policies, the authorities must focus on a number of issues besides disparities in income and economic development. It is intended that the Sidoarjo Regency's population wellbeing would be better (Sholihah & Kustanto, 2017).

One of the variables that might impact a region's economic development is inflation and investment. The impacts of investment and inflation on Java's economic development and

societal wellbeing between 2006 and 2016 are the main subject of this study. Path analysis and multiple linear regression analysis were the analytical techniques employed in this investigation. The study's results show that economic development, as opposed to inflation and investment, has a positive and substantial influence on people's wellbeing in Java Island between 2006 and 2016. The study also found that people's welfare was negatively impacted by inflation and investment and positively impacted by economic development (Sari *et al.*, 2019).

Research of Pangiuk, (2018) showed that poverty is unaffected significantly by economic growth. Due to their greater value in comparison to growth's worth, these variables do not have the most significant impact on the amount of economic development on poverty. According to the analysis's findings, Jambi province's growth and economic development saw the highest percentage of growth in 2011—8.54%—and the lowest percentage—5.57%—between 2009 and 2013. According to the progression of poverty in the region of Jambi, the greatest percentage of the poverty ratio from 2009 to 2013 was 2013, with a total of 31.78%, and the lowest percentage was 26.04% in 2011. The influence of economic development on poverty in the region of Jambi, in which the growth of the economy variable has no impact, is not statistically significant, or has a negative unit value on poverty. This demonstrates that poverty in the province of Jambi is unaffected by economic progress.

Economic development has a adverse and large effect on the wellbeing of the community, capital spending has a positive and substantial influence on the welfare of the community, and the impact of capital spending on economic development is negative and large (Sita, 2017). In Central Java Province, social welfare is not much impacted by economic development or foreign investing, but is somewhat impacted by local investment and capital spending (Nisa & Handayani, 2021).

Total Population: If people's living standards change, welfare will also shift. As a result, poverty will always exist because the idea of poverty is dynamic. Some academics approach poverty via distinct lenses of social injustice. Poverty is comparatively closely tied to the issue of income distribution because more people fall into the poor category when there is a larger split between the upper and lower classes (Ginting & Rasbin, 2020).

One issue that must be taken into account is labor productivity. Given that there will be more employees due to population expansion, but a given quantity of infrastructure, the quantity of production (output) in both the service and industrial sectors will decrease as a result of the increased labor force. That is to say, Ricardo claimed that the law of declining marginal product, often known as the rule of diminishing returns, states that with finite area of land, growth



in population (labor) will lower the marginal output (Asjari, 2015).

One of the pillars for figuring out how economic development will evolve is the theory of economic growth. Economic development directly affects how much individuals earn, how evenly they earn it, and how many people are living in poverty. A rise in the GRDP, which is the overall term for the outcomes of all economic activity in a region, indicates economic development in that region. Economic development in a region can show if development has been successful since it shows how well-intentioned development programs have worked. Economic development describes or quantifies how well an economy has developed. Population, the entire supply of capital items, geographical area, resources from nature, and the amount of technology employed are all variables that have an impact on the expansion of the economy based on (Pratiwi & Indrajaya, 2019).

In comparison to other islands, Java Island has a sizable population and a sizable economy in Indonesia. A province with rapid economic growth is West Java. Nevertheless, despite rapid growth in the economy, income has not been distributed fairly among the population. One of the measurements used to evaluate income disparity is the Gini index. As the inequality comes closer to 1, its value rises, and as it goes closer to 0, its value falls (Febrianto, 2017).

Well-Being: Development is an ongoing process of change with the goal of improving participant wellbeing. Development must be accomplished by the government in all regions, including those related to health, education, and a better quality of life. The process of expanding a person's options is known as human growth. Among all of these options, choosing to live a long and healthy life, getting an education, and having access to the means needed to live a decent life are the most crucial decisions. Consequently, the vast majority of nations, developed as well as developing nations, use the Human Development Index (HDI) or the Human Development Index (IPM) as a gauge for assessing the level of human resource (Shavira *et al.*, 2021).

Growth in the economy seeks at boosting actual per capita income over the course of time, and institutional system development comes after that. The purpose of development is to promote societal wellbeing. A rise in growth in the economy and an equitable distribution of income are indicators of community wellbeing (Sholihah & Kustanto, 2017). One way to promote greater growth is through regional autonomy. Economic development and social wellbeing may be enhanced by policy. Local governments will manage resources more effectively in every area and provide public amenities to speed up economic activity (Sholihah & Kustanto, 2017).

The enhancement of human welfare is one of the objectives of economic development. Economic development, the structure of the economy, and the shrinking income disparity between inhabitants, between regions, and across industries

within an area may all be used as benchmarks for the effectiveness of development. In addition to producing rapid development, the primary objective of economic development must also include strategies to lower or eliminate poverty rates, income disparities, and unemployment rates. An economy's attempts to enhance its economic operations such that more infrastructure is readily available, more businesses are expanding, levels of education are rising, and technology is advancing might be understood as economic development. It is anticipated that this progress would lead to more employment possibilities, higher education standards, and improved human prosperity (Sari *et al.*, 2019).

If strong economic development leads to increased economic activities and open work prospects, a demand for workers will also boost possibilities for employment and have an effect on raising people's incomes in order to ensure welfare for individuals increases. This sort of circumstance will logically have the effect of creating a pull force that will encourage people of lower-income areas to look for employment in higher-income places. Increasing production per person over the long run is a process of growth in the economy. Process, per-capita production, and long-term are the three primary components. The process demonstrates how development in the economy will continue to fluctuate over time and how per capita income levels are rising as a result, despite the fact that per capita income increases are not always accompanied by increases in economic development (Mahmut *et al.*, 2022).

METHODS

This research looks at how population and economic expansion in West Java Province may or may not have an impact on breeders' welfare. 2018b). A literature study is a research project that uses literature (a library), i.e., a study that looks at a number of journal articles and books that are on macroeconomic variables like growth in the economy, growth in the population, and welfare in order to gather secondary data. Data were taken from the Food Security and Livestock Service Office of West Java Province, the Office in charge of Animal Husbandry and Animal Health Functions in Subang, Purwakarta, Bogor, and Sukabumi Regencies, the West Java Central Bureau of Statistics as well as data from related journals and articles. Multiple regression analysis approaches are employed in data analysis procedures.

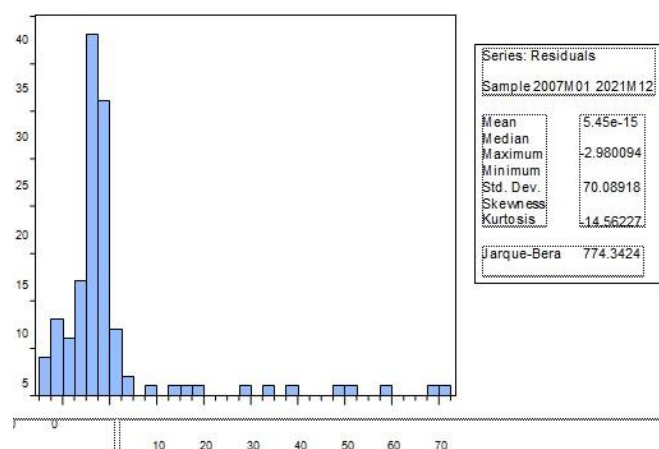
RESULTS AND DISCUSSION

Classic assumption test

a. Normality test: The estimated JB (Jarque Bera) Probability value is compared with an Alpha level of 0.05 (5%), which determines whether the residuals have a normal distribution or not. It may be said that the residuals have a normal distribution if the Prob. JB count is below 0.05. The histogram



and the Jarque Bera test, which are both examples of the normality test, are shown in the image:



Source: Output Eviews 8 (secondary data processed in 2022)

Figure 1. Normality test results

According to the results of the data photographs processed by the Eviews 8 software, which show that the Jb (Jarque Bera) value is 774.3424 and the Probability value is 0.0000 (5%), the residual values in this study have a normal distribution.

b. Multicollinearity test: The Centered VIF column table illustrates the testing of multicollinearity. It is possible to state that multicollinearity does not exist if the VIF value is less than 10. The following are the outcomes of the data processing:

Table 1. Multicollinearity Test Results

	X1	X2
X1	1.000000	0.279708
X2	0.279708	1.000.000

Source: Output Eviews 8 (secondary data processed in 2022)

The variables X1 (population development ratio) and X2 (unemployment ratio) appear to have a coefficient of 0.279708 0.8 based on the output values mentioned above, indicating that there is not a linear connection among the three variables.

c. Autocorrelation Test: The Lagrange multiplier (LM) test, also known as the Breusch-Godfrey approach, could be employed to test for autocorrelation signs. Regarding data processing, as follows:

Table 2. Autocorrelation test results.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	51.42128	Prob.	0.0000
		F(2,115)	
Obs*R-squared	56.65150	Prob. Chi-Square(2)	0.0000
Test Equation:			

Dependent Variable: RESID Method: Least Squares

Date: 12/26/22 Time: 13:54

Sample: 2022M01 2022M12

Included observations: 120

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.2498	6.8353	0.3291	0.7426
X1	0.0555	0.3404	0.1630	0.8708
X2	-0.0519	0.1124	-0.4616	0.6453
RESID(-1)	0.7653	0.0925	8.2769	0.0000
RESID(-2)	-0.1224	0.0925	-1.3228	0.1885
R-squared	0.472	Mean dependent var		0.000
Adjusted R-squared	0.454	S.D. dependent var		14.710
S.E. of regression	10.872	Akaike info criterion		7.651
Sum squared resid	13592.740	Schwarz Criterion		7.767
Log likelihood	-454.061	Hannan-Quinn criter.		7.698
F-statistic	25.711	Durbin-Watson stat		2.020
Prob(F-statistic)	0.000			

Source: Output Eviews 8 (secondary data processed in 2022)

According to the findings of the Breusch-Godfrey Autocorrelation test performed using Eviews 8, the Prob. Chi-Square is 0.0000 (5%), indicating that there are no autocorrelation issues with the data.

d. Heteroscedasticity Test: Test Park

Table. 3 Park Test Results

Heteroskedasticity Test: Harvey

F-statistic	26.766	Prob.	0.0000
		F(2,117)	
Obs*R-squared	37.669	Prob. Chi-Square(2)	0.0000
Scaled explained SS	33.720	Prob. Chi-Square(2)	0.0000

Dependent Variable: LRESID2

Date: 12/26/22 Time: 13:54

Sample: 2022M01 2022M12

Included observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.108	5.052	0.000	1.108
X1	0.055	-7.301	0.000	0.055
X2	0.018	2.495	0.014	0.018
R-squared	0.314	Mean dependent var		2.909
Adjusted R-squared	0.302	S.D. dependent var		2.111
S.E. of regression	1.763	Akaike info criterion		3.997
Sum squared resid.	363.697	Schwarz criterion		4.066
Log likelihood	-236.802	Hannan-Quinn criter.		4.025
F-statistic	26.766	Durbin-Watson stat		0.688
Prob(F-statistic)	0.000			

Source: Output Eviews 8 (secondary data processed in 2022)

Interpretation: According to the reviews' findings, X1's prob. value is 0.0000 (5%), suggesting that there is no heteroscedasticity in the data, whereas X2 gets a prob value. The data on variable X2 pass the Park test since their heteroscedasticity issues are less than or equal to 0.0140 (5%).



Multiple Linear Regression Analysis**Table 4. Results of Multiple Linear Regression Analysis.**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.047	9.320	1.078	0.283
X1	-1.164	0.464	-2.507	0.014
X2	0.448	0.153	2.928	0.004
R-squared	0.091	Mean dependent var		20.564
Adjusted R-squared	0.075	S.D. dependent var		15.425
S.E. of regression	14.835	Akaike info criterion		8.257
Sum squared resid.	25748.500	Schwarz		8.326
Log likelihood		Criterion Hannan-Quinn		
		criter.		8.285
F-statistic	-492.391	Durbin-Watson stat		0.639
Prob(F-statistic)	5.831			

Source: Output Eviews 8 (secondary data processed in 2022)

Dependent Variable: Y Method: Least Squares

Date: 12/26/21 Time: 13:54

Sample: 2022M01 2022M12

Included observations: 120

In this study, multiple regression analysis was used to determine the effect of population increase and economic development on the welfare of farmers in the West Java Province.

The multiple regression equation used in the present study has been composed as follows:

$$Y = a + b_1X_1 + b_2X_2 + e$$

$$Y = 10.0470 - 1.1637 + 0.4482 + e$$

Information :

a = constant 10.0470

X1 = economic growth

X2 = total population

b1 = -1.1637

b2 = 0.4482

The coefficients in the equation for multiple linear regression are explained as follows:

The constant number (a) in the regression equation is 10.0470, which indicates that if growth in population and the growth of the economy are equal to 0, then the average farmer well-being will be 10.0470%.

s development has a regression coefficient value of -1.1637, with a negative value. This means that, assuming all other variables remain constant, the well-being of breeders will decline by -1.1637 for every unit reduction in economic development.

c. The regression equation demonstrates that the population has a positive regression coefficient value of 0.4482, indicating that, provided other variables remain constant, the welfare of farmers will improve by 0.4482 for every unit increase in population. This means that when populace develops, farmers' welfare also grows.

Interpretation :

a. t test (Partial): Economic development, or variable X1, has a positive impact on farmer welfare, as indicated by its coefficient value of -1.1637, t-statistic value of -2.5066, and probability value of 0.0136 (5%). Population variable X2 has

a positive impact on farmer welfare, as evidenced by its coefficient value of 0.4482, t-statistic value of 2.9277, and probability value of 0.0041 (5%).

b. Simultaneous F test: Economic development and population growth are both concurrently having significant impact on variable Y (breeder wellbeing), as indicated by the probability value of the f-statistic, which is 0.0038 (5%).

c. Coefficient of Determination: With an R-Squared value of 0.0906, economic development and growth in population have a 9.06% impact on farmer welfare.

The effect of economic growth on the welfare of farmers in west Java province: Economic development is a process of constant population balance between elements that might cause population expansion and decline. The ability of a place to utilize the possibilities of its inhabitants is challenged by its rapid economic growth.

Relying on multiple linear regression tests on the population development variable in this study, it is determined that the probability value is 0.0136 0.05. Therefore, it may be inferred that H_a is approved and H_o is rejected, indicating that population development partially negatively affects farmers' welfare in West Java Province. This study is consistent with previous studies (Fathurohman & Purwasih, 2022) asserts that the quantity of active livestock flock members and existing livestock flocks both have an impact on farmers' welfare (Fathurohman *et al.*, 2018).

The findings of the present research were then altered to reflect the belief that population increase and economic development are related (Fathurohman, 2022). He contends that as the population grows, so does the amount of labor required, increasing both output and welfare for farmers if the community fails to meet the increased demand. Conversely, as the population falls, there is a corresponding drop in the amount of work, which lowers output.

The effect of population on the welfare of farmers in west Java province: The entire population serves as an example of the proportion of the local population's condition. An individual who is already considered to be employed, actively seeking employment at a particular salary level, but is unable to get it, is said to be unemployed. A region's economic development will, at some point, be influenced by its unemployment rate.

In light of the results of multiple linear regression analysis on the unemployment rate variable and the research findings regarding the population on the welfare of breeders in West Java Province in 2020–2022, it can be concluded that the population has a significant impact on farmers' welfare with a probability value of 0.0041–0.05. As a consequence, the study's findings indicate that H_o is rejected and H_a is approved, indicating that the population will partially have a substantial impact on the welfare of farmers in the West Java Province in the years 2020–2022. This study was subsequently modified to research (Piarna & Fathurohman, 2020) that all current capacity must be employed to discover,



produce, and seek employment, implying that we have to work tirelessly and as extensively as we possibly can to obtain fortune (Fathurohman *et al.*, 2019).

The number of jobless persons reveals the total number of unemployed individuals, and the unemployment rate, which displays the proportion of unemployed, reveals the number of jobless or those without a steady job (Fathurohman, 2018a). The number of jobless people itself are not the main cause for concern when it comes to unemployment in the livestock industry; rather, it is the unemployment rate as a proportion of the entire employment. The growth of the economy will slow down when unemployment levels are high in an area, which will have an adverse effect on the growth of the economy. This is due to the fact that unemployment will have an immediate negative influence on the less affluent population, which is obviously detrimental to the wellbeing of farmers (Fathurohman, 2016).

The Effect of Economic Growth and Population on the Welfare of Farmers in West Java Province

According to the study's results utilizing the multiple linear regression model (f test), there is a simultaneous or combined significant impact of population increase and economic development on the welfare of farmers with a probability value of 0.0038 0.05. According to the study's findings, H_0 is rejected and H_a is approved, and in West Java Province in 2020–2022, economic development and growth in population will have a substantial impact on farmers' wellbeing.

Accelerated growth in the economy will provide a surplus of labor, and as the population develops, so will the demands on that workforce, therefore, strong human resources must be supported by the government since they have considerable possibilities if supervision is done well and sustainably (Fathurohman, 2016). As economic development accelerates, breeders' welfare rises as seen by the population patterns in a region (Baharta *et al.*, 2019).

Conclusion: The study's findings indicate that the welfare of breeders in the West Java Province is impacted by both growth in population and economic development, with population development having the greatest influence between 2020 and 2022 (0.0136 to 0.05). Farmers' well-being in 2020–2022 was significantly impacted by the individual statistical significant test (t-test) results for the variable number of inhabitants without a job, with a value of 0.0041 0.05. With a value of 0.0038 0.05, the results of the test using the multiple linear regression model demonstrate that the independent variables, namely economic development and population, significantly affect the well-being of farmers in West Java Province. The results of the test for the coefficient of determination also show that the independent variables of growth in population and growth in the economy can only account for 0.38% of the variance in farmer well-being; the remaining 99.62% is influenced by other factors such as the rate of inflation, schooling, and other variables.

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Code availability: None

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